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APPALACHIAN FOREST EXPERIMENT STATION

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INTERPLANTING OF LAUREL AND RHODODENDRON THICKETS WITH WHITE PINE

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By

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The common laurel and rhododendron occur locally in the southern Appalachians as dense thickets which usually exclude the natural reproduction of desirable tree species. Rhododendron often occupies excellent timber-growing areas while laurel is usually confined to the drier locations ranging from fair to very poor sites. The interplanting of laurel and rhododendron thickets as a stand improvement measure has not been attempted on any practical scale because of the lack of methods known to be successful, and the obviously high cost of the work. The purpose of the present study was to determine the site preparation treatment necessary to assure the establishment of planted trees in the thickets. White pine was thought to be the best species for planting in such areas because of: (1) its rather high tolerance to shade, (2) its rapid height growth after the first two or three years, and (3) its adaptability to the wide variety of sites upon which laurel and rhododendron occur.

T. A. Wilson, formerly ranger on the Mt. Mitchell District of the Pisgah National Forest, was probably the first to attempt practical stand improvement by interplanting laurel and rhododendron thickets with white pine. In issuing permits to nurserymen to remove laurel and rhododendron for ornamental stock, he frequently required the planting of the openings to white pine as a condition of the permit. Some of these plantings were partly successful and indicated that further study might develop a method capable of wider application. The purpose of this note is to summarize the results of planting on 26 experimental plots established in 1935 on the Pisgah National Forest (western North Carolina) and the Toccoa Experimental Forest (northern Georgia), and to give recommendations for interplanting of laurel and rhododendron thickets in areas of low scenic value where timber growing is paramount.

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Summary of Results

In the experiments seven methods of site preparation before planting white pine were tested: (1) thicket clear-cut just before planting, (2) thicket clear-cut and roots grubbed to eliminate sprouts, (3) strips about 6 feet wide cut through thicket and planted, (4) 6-foot strip clear-cut and roots grubbed, (5) spots 6 to 8 feet in diameter clear-cut, (6) spots 6 to 8 feet in diameter clear-cut and grubbed, and (7) thicket summer-burned. Burning was not successful in killing back the thickets except for a few scattered clumps. In these clumps the planted trees have been successful but survival on the whole plot was only 37 percent and growth was poor.

The two main conclusions from the study are: (1) white pine can stay ahead of laurel and rhododendron sprouts resulting from cutting of thickets, (2) a complete clear-cut of the thickets is not always essential. These facts answer the two important questions about site preparation and form the basis of recommendations for introduction of white pine into laurel and rhododendron thickets.

Grubbing of roots proved to be very expensive and had little advantage over cutting alone. After 5 years, average tree height was 2.8 feet in grubbed plots and 2.5 feet in plots cut but not grubbed. In both cases survival was 77 percent. Where the thicket was not too high and dense, both the cutting of lanes and spots proved nearly as successful as a complete clear-cut. It was found, however, that 6- to 8-foot spots were failures in dense thickets 10 to 18 feet high. Survival was still good after 5 years but the trees were definitely suppressed and would probably never be able to grow through the thicket. Six-foot strips in thickets 10 to 14 feet tall were also too narrow for good results, although present indications are that a considerable number of pines will be able to emerge. In thickets 6 to 8 feet high, the cutting of spots or strips 6 to 8 feet wide gave results nearly as satisfactory as complete cutting. The evidence indicates that the width of strips must be at least three-fourths the height of the thicket and the width of spots equal to its height to insure emergence of the planted trees.

Recommendations for Interplanting Thickets

The following recommendations are based mainly on the facts as given above and on the need for maintenance of conditions which cause maximum natural pruning of the lower branches of the planted white pine.

(1) The general rule in cutting strips for planting is that

the width should be at least three-fourths the height of the thicket being cut. Diameter of spots should be equal to height of thicket. For thickets of various heights the rule will work about as follows:

Thickets 1-5 feet high: Cut lanes 2 or 3 feet wide spaced 6 feet from center to center and plant trees 6 feet apart in center of lanes. This will provide about 1,200 trees per acre. Spots spaced 6 x 6 feet and equal in width to height of the thicket may be more economical for thickets not over 3 feet high.

Thickets 6-10 feet high: Cut lanes 5 to 7 feet wide spaced about 12 feet from center to center and plant trees 4 feet apart in center of lanes. This will give about 900 trees per acre and natural pruning will result from the close spacing along the row and the competition of the thicket between the rows. Circular spots should be as wide as the height of the thicket and spaced 12 x 12 feet from center to center with 2 trees planted per spot, or a total of about 600 trees per acre. Use of spots would probably be preferable at the lower range of height, but in 10-foot thickets, strips probably would be cheaper and more successful.

Thickets 11-20 feet high: Cut lanes 9 to 15 feet wide, spaced about 18 feet from center to center. In each lane plant 2 rows of trees 4 feet apart with 6 feet between trees in the rows. This arrangement will give about 800 trees per acre. Circular spots 18 feet from center to center can be used to advantage only if the thicket is not more than about 14 feet, as heights much above this would require virtual clear-cutting. Probably the best arrangement for planted trees in such cleared spots is in the form of a 4-foot equilateral triangle with a tree at each apex.

(2) Any accidental burn severe enough to kill thickets back to the ground can be successfully planted to white pine. If planting is done between the time of the burn and the start of the next growing season the trees ordinarily will outstrip the sprouts. Spacing should be about 6 x 6 feet.

(3) Operations for pipe or ornamental stock, leaving openings with a width equal to the height of the thicket, can be successfully planted to white pine. In a small opening 2 trees should be planted near its center. Openings 10 to 20 feet wide should have 3 or 4 trees, and in large openings, 6 x 6 foot spacing can be used.